

**MC3800 Series
1/3-Inch Monochrome
Camera**

**Installation/
Operation Manual**

C1901M (4/99)

IMPORTANT SAFEGUARDS AND WARNINGS

1. Installation and servicing should only be done by qualified service personnel and conform to all local codes.
2. To prevent fire or shock hazard, do not expose the unit to rain or moisture.

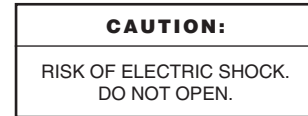
The product and/or manual may bear the following marks:



This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



Please thoroughly familiarize yourself with the information in this manual prior to installation and operation.

DESCRIPTION

The MC3800 Series cameras are 1/3-inch format monochrome CCD (charge coupled device) cameras. They have the following features:

- High resolution and high sensitivity
- CCD iris function
- AGC (automatic gain control)
- AC line lock
- C/CS lens mount
- Auto-iris connector for DC-driven lenses
- Level and backlight control (BLC) for various lighting conditions
- Isolated power circuit

MODELS

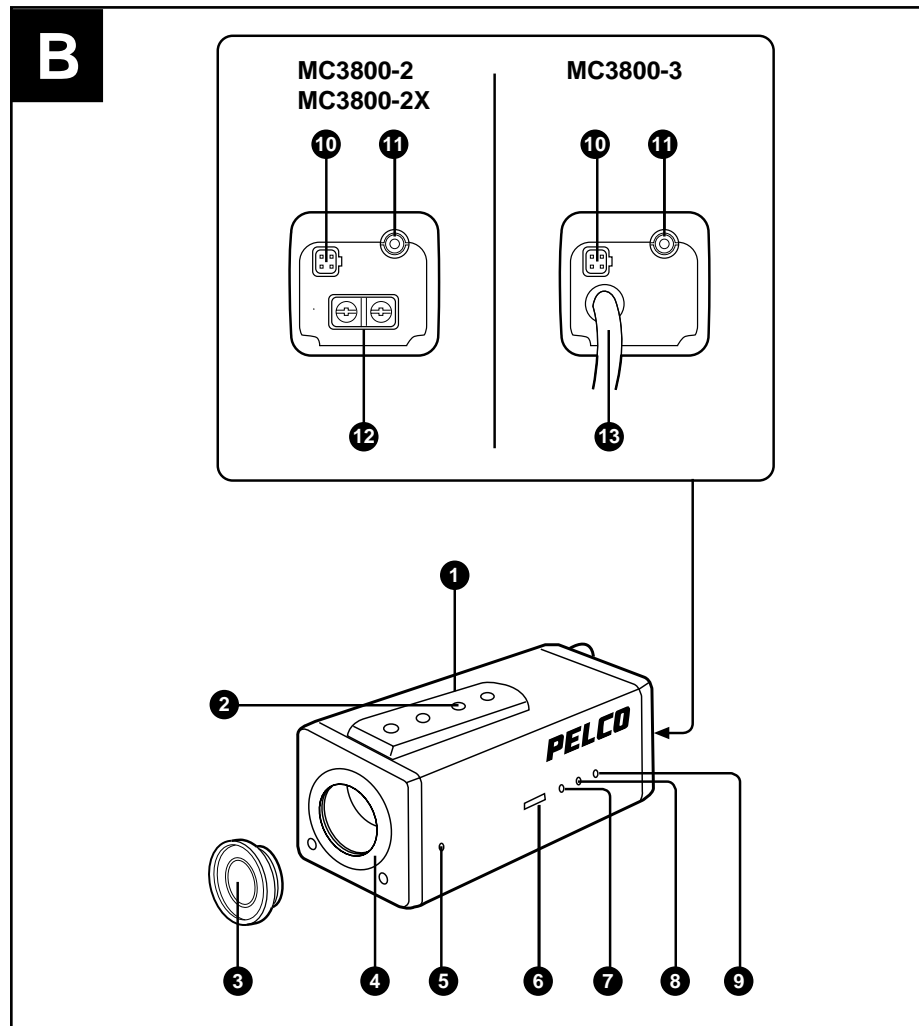
MC3800-2	24 VAC, EIA standard
MC3800-2X	24 VAC, CCIR standard
MC3800-3	230 VAC, CCIR standard

LOCATION AND FUNCTION OF PARTS

Refer to Illustration B for the location of the camera parts.

NOTE: References to illustrations in this manual are keyed to the illustrations in the manual that is supplied with the camera.

- ① Tripod adapter (may be attached to top or bottom of camera)
- ② Camera mounting receptacle (1/4-inch UNC-20)
- ③ Lens mount cap
- ④ C/CS lens mount
- ⑤ C/CS adjustment pot
- ⑥ CCD iris switch
- ⑦ Level adjustment pot
- ⑧ Backlight control (BLC) adjustment pot
- ⑨ V-phase adjustment pot
- ⑩ Lens connector (four-pin)
- ⑪ Video output (BNC connector). Connect to the VIDEO IN connector of a monitor.
- ⑫ MC3800-2/MC3800-2X: 24 VAC power input terminals
- ⑬ MC3800-3: 230 VAC power cord



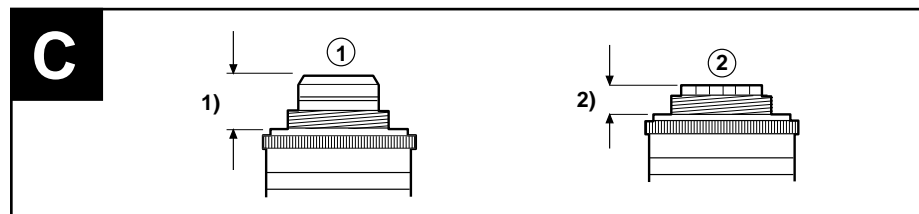
Top/Front/Side/Rear Views of MC3800 Series Cameras

INSTALLATION

LENS

The lens must be either a C- or CS-mount type weighing less than 1 kg (2.2 lb). The protrusion behind the mounting surface must be within the limits shown in Illustration C.

- ① C-mount lens
1/2-inch (12 mm) or less
- ② CS-mount lens
9/32-inch (7 mm) or less



Compatible Lenses

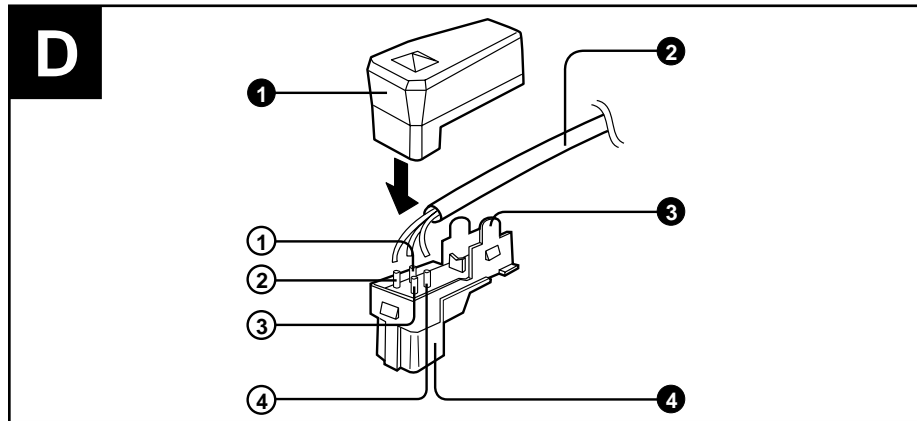
Be sure to attach the lens mount cap when the lens is not mounted.

When using an auto-iris lens, use only a DC-driven type or a direct current drive coil with a resistance value over 150 ohms.

When using an auto-iris lens, attach it as follows. For a manual lens, omit step 3. Refer to Illustration E.

1. Unscrew the lens mount cap.
2. Screw in the lens. Make sure the C/CS adjustment ring is set properly.
3. Check the plug wiring on the lens cable against Illustration D and the pin-outs in the "Plug Change on Auto-Iris Lens Cable" box. If you need to replace the existing plug, follow the instructions in the box.
4. Adjust the backfocus. Follow the appropriate instructions in the "Lens/Camera Setup and Backfocusing" Information Box. These instructions cover the setting of the CCD IRIS switch (Illustration A in the owner's manual). Also, if necessary, refer to the "Camera/Lens Geometry-General Information" sheet.

- ① Cover (supplied)
- ② Auto-iris lens cable
- ③ Rib (If the cable is thick and the plug cover does not seat properly, cut away this rib.)
- ④ Lens plug (supplied)

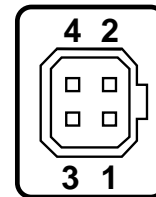


Changing the Plug on an Auto Iris Lens Cable

PLUG CHANGE ON AUTO IRIS LENS CABLE

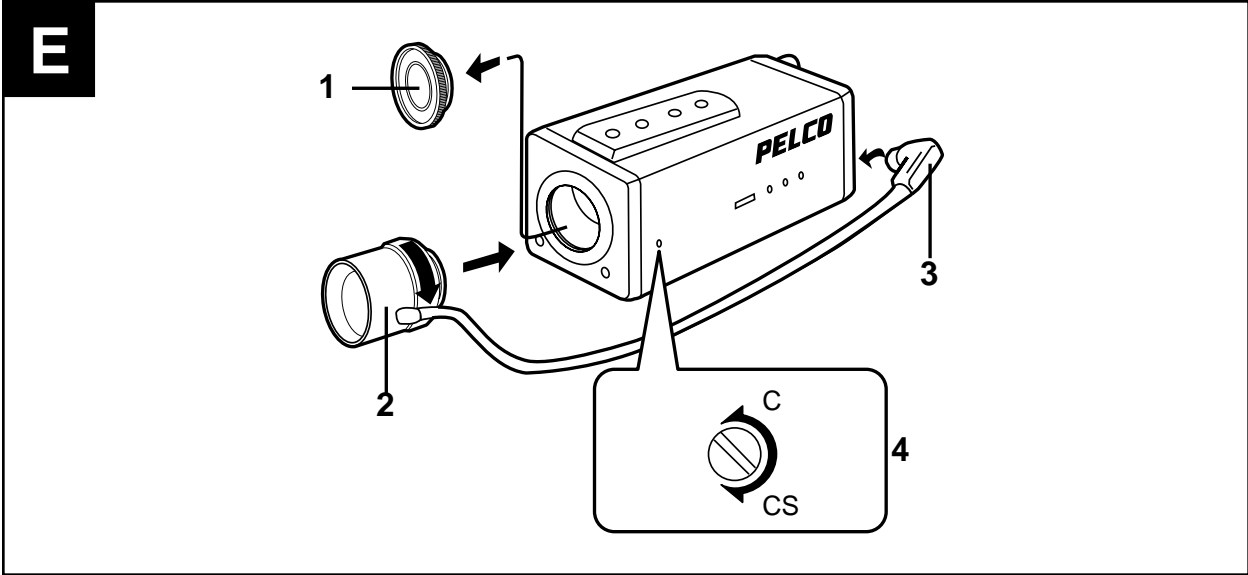
1. Remove the old lens plug from the cable.
2. Remove the plug cover ①, add heat shrink tubing to the wires and solder the lens cable wires ② to the pins ① thru ④ on the plug supplied. Apply heat to the heat shrink tubing. The pin assignments are as follows:

Pin #	DC-servo Lens
① Pin 3:	Drive (+)
② Pin 1:	Control (-)
③ Pin 2:	Control (+)
④ Pin 4:	Drive (-) (Ground)

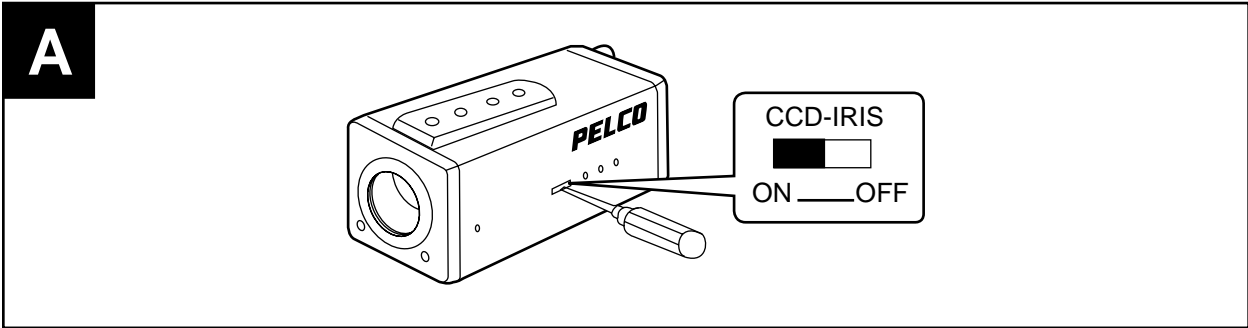


Auto Iris Plug
Pin-out (Back of Plug)

3. Put the cover on the plug.

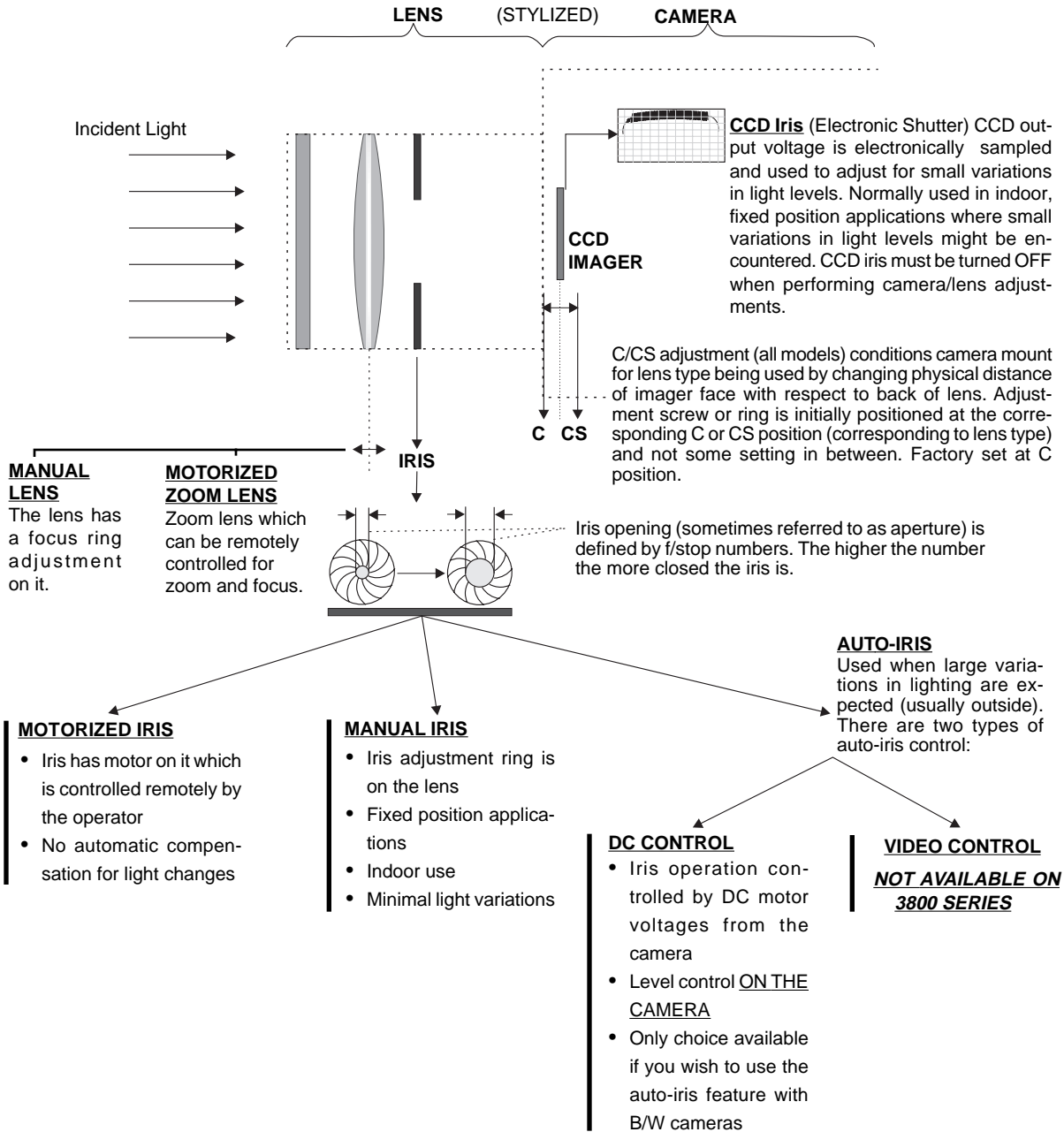


Lens Installation

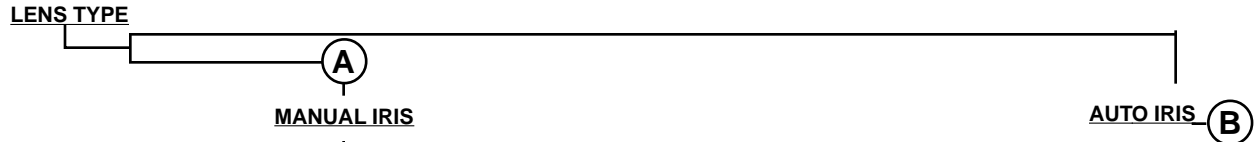


CCD-Iris Function

CAMERA/LENS GEOMETRY—GENERAL INFORMATION

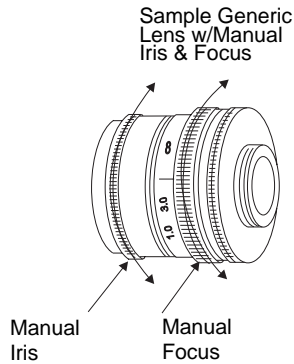


The purpose of backfocusing is to make the adjustments necessary for the picture to remain in focus throughout the camera's zoom range, which is the case for instance, in motorized zoom, auto iris configurations. Manual Iris lens/camera combinations also need to be backfocused. Follow the general instructions listed below to adjust backfocus appropriate to your camera/lens combination.



VARIABLE LIGHT CONDITIONS

- Turn **Manual Iris** ring so iris is fully open and set the **Focus ring** for ∞ (or distant object).

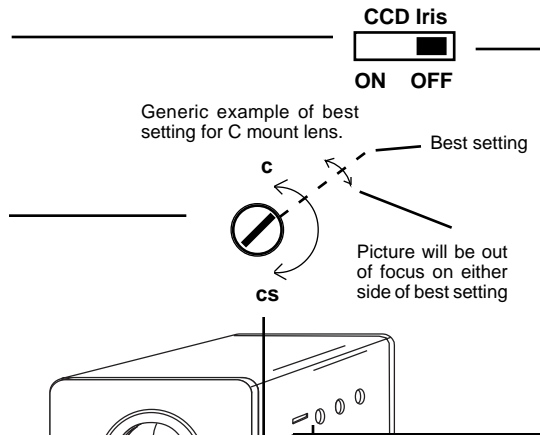


STATIC LIGHT CONDITIONS

- Adjust Backfocus the same as was done for Variable Light conditions except **CCD iris** is left in the **OFF** position; therefore, there is no need to adjust the LVL control; follow all other steps, however.

- Adjust Backfocus with **CCD IRIS** switch initially set to the **OFF** position.

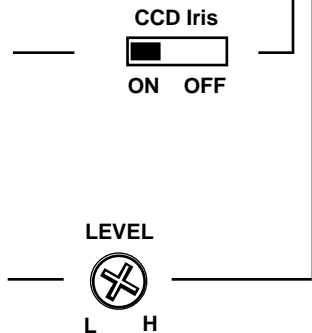
- Use the **C/CS** adjustment **POT** on the side of the camera to obtain the best picture. This moves the imager with respect to the lens. (The picture may bloom on either side of the best setting within the C/CS adjustment range).



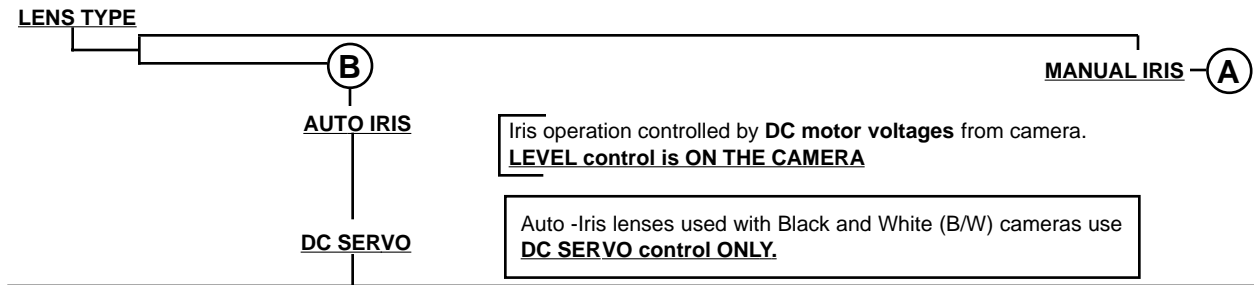
- Turn **CCD IRIS** switch to **ON** position.

- Re-adjust manual iris, if necessary, for optimal lighting.

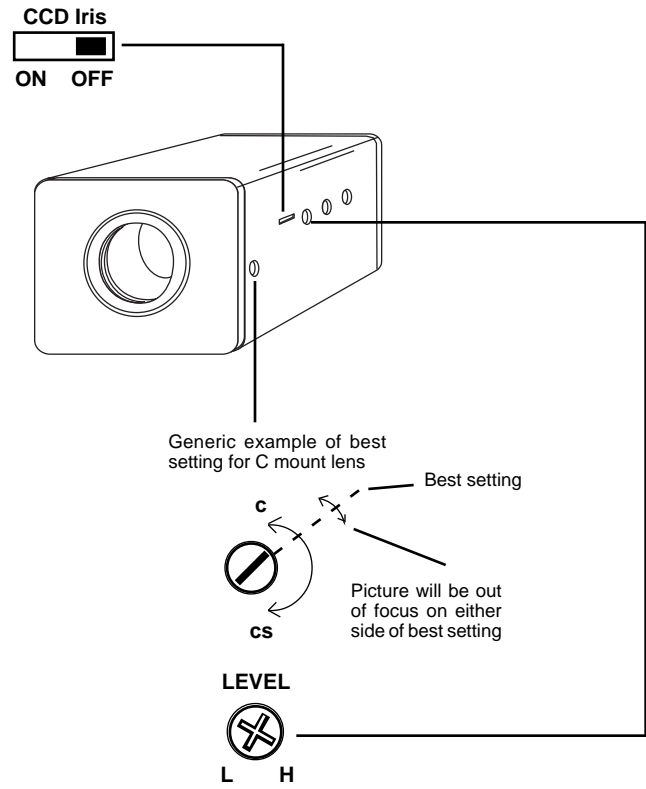
- Fine tune the **LEVEL** control for best picture.



The purpose of backfocusing is to make the adjustments necessary for the picture to remain in focus throughout the camera's zoom range, which is the case for instance, in motorized zoom, auto iris configurations. Manual Iris lens/camera combinations also need to be backfocused. Follow the general instructions listed below to adjust backfocus appropriate to your camera/lens combination.



- To Adjust Backfocus, set CCD Iris switch to the OFF position.
- Use a neutral density filter or some other physical means to decrease the amount of light entering the camera lens so that the auto-iris response is to open the iris up as wide as possible.



BACKFOCUS ADJUSTMENT

- Adjust focus to far, zoom to wide angle.
- Adjust **C/CS adjustment Ring** on the camera for the best picture.
- Zoom to a close object; adjust lens controller or focus for best picture.
- Repeat above until lens remains in focus throughout the zoom range (far to near).
- Tighten the Lock Screw.

The ability of a zoom lens to remain in focus throughout its zoom range is known as **Tracking**

- Adjust the **LEVEL POT** on the camera for best picture.
- Adjust other settings on camera as needed.

CAMERA

Install the camera where it will not be affected by fluorescent lights or window reflections. If the camera is used under illumination that is not steady, the picture may flicker.

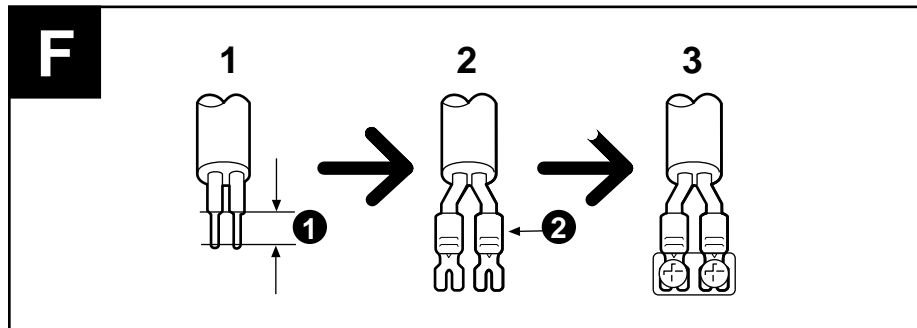
The MC3800-2 must be operated with a 24 VAC, 60 Hz, Class 2 power supply.
The MC3800-2X must be operated with a 24 VAC, 50 Hz power supply.
The MC3800-3 must be operated with a 220-240 VAC, 50 Hz, power supply.

To connect the camera:

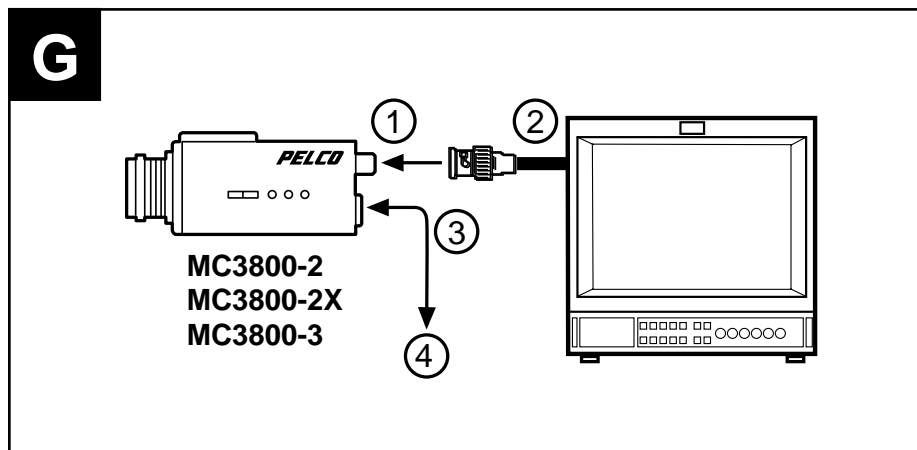
1. Refer to Illustration G. Connect the video cable (2) from the monitor to the VIDEO OUT connector (1) on the camera.
2. MC3800-2/MC3800-2X: Connect the power leads to the camera. Refer to Illustration F.
 - a. Remove the insulation from the power cable wires.
 - b. Attach the terminal tips.
 - c. Connect the wires to the terminals on the camera.
 - d. Ground the unit or an irregular voltage may be generated in the AC power cord and may cause malfunction or damage to the video camera. Ground the camera at the screw labeled "G."

Maximum cable lengths for 24 VAC: 18 AWG, 200 ft (60 m); 16 AWG, 325 ft (100 m).

3. Refer to Illustration G. Connect the power cord or leads (3) to a power source (4). For the MC3800-3, the brown wire is the hot lead, the blue wire is neutral, and the green and yellow wire is ground.



Connecting the MC3800-2



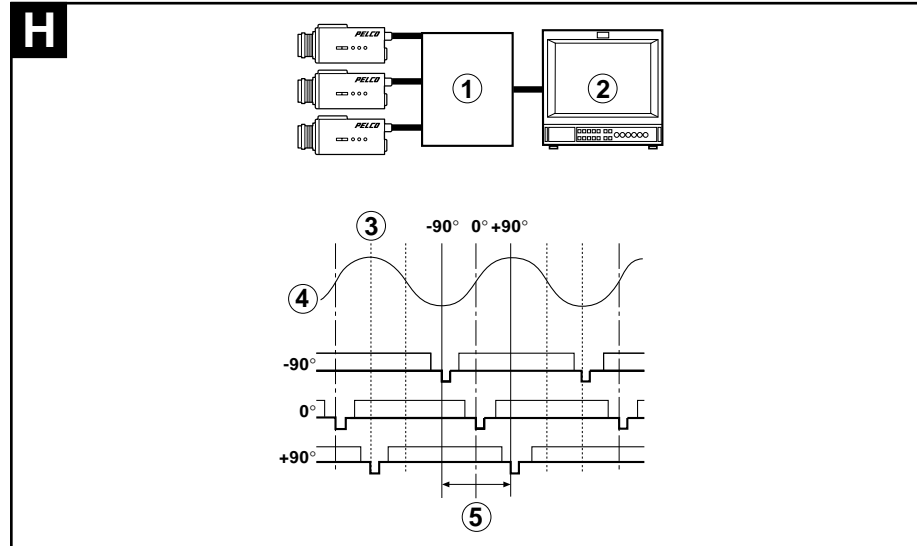
Connecting the Monitor to the MC3800 Series Cameras

V-PHASE ADJUSTMENT

Vertical phase adjustment is required only if your system uses two or more cameras.

The vertical phase can be manually adjusted within the range of approximately -90 degrees to +90 degrees (refer to Illustration H).

- ① Camera switcher
- ② Monitor
- ③ Voltage phase
- ④ Vertical drive signal
- ⑤ Adjustable range



AC Line Lock Adjustment

Vertical phase adjustment is not vertical roll adjustment. Each camera is adjusted to the AC zero crossover point at the factory. Problems arise, however, especially in larger systems, when:

1. Switching rapidly between widely separated cameras with manual or sequential switchers.
2. Switching between cameras not operating off the same phase of the AC line. When using a single power source, make sure each AC line lead is connected to the same input terminal on all cameras.
3. Both of the above.

In such cases camera switching may produce what appears to be vertical roll on the monitor between the two views (Illustration I).

To adjust the vertical phase:

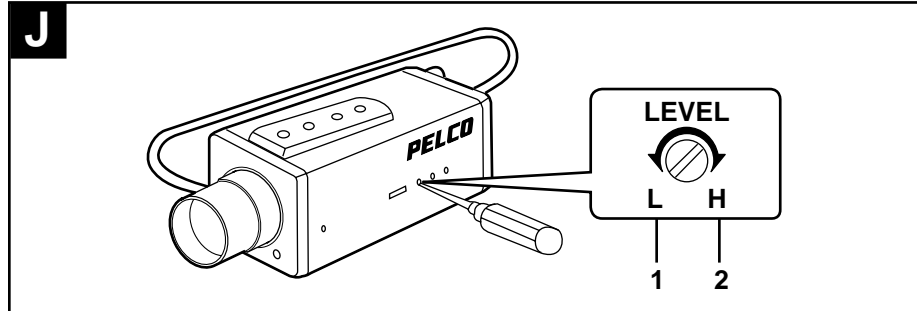
Turn the V-phase pot (while switching as rapidly as possible between the two camera views) to adjust the relative phase angle between the two cameras and the point at which one camera synchronizes to the AC line with respect to the other. Adjust the pot until the switching is clean and there is no vertical roll or flip.



Vertical Phase

INCIDENT LIGHT LEVEL ADJUSTMENT

Since the incident light level has been preset at the factory, usually no further adjustment is required. If the picture is too dark, however, or if the picture's highlights are extremely overexposed, adjust the LEVEL adjustment screw. This adjustment can only be used for auto-iris lenses or CCD iris control.



Adjusting the Incident Light Level

1. Turn toward L (low) to make the picture darker.
2. Turn toward H (high) to make the picture brighter.

BACKLIGHT CONTROL ADJUSTMENT

You can compensate for backlight conditions by turning the backlight control (BLC) screw. When using this unit under backlight conditions, turn the BLC screw toward AV.

SPECIFICATIONS

Image Device:	1/3-inch CCD (charge coupled device)
Picture Elements:	
MC3800-2:	250,000: 510 H x 492 V
MC3800-2X:	290,000: 500 H x 582 V
MC3800-3:	290,000: 500 H x 582 V
Sensing Area:	3.3 mm x 4.4 mm
Signal System:	
MC3800-2:	EIA standard
MC3800-2X:	CCIR standard
MC3800-3:	CCIR standard
Sync System:	AC line lock
Horizontal Resolution:	Approximately 380 lines (at center of screen)
Lens Mount:	C/CS mount
Minimum Illumination:	0.1 lux (f/1.2)
S/N:	45 dB (AGC off)
Automatic Control:	Electronic iris (exposure priority, up to 1/100,000 second linear shutter speed control); AGC (automatic gain control)
Power Requirements:	
MC3800-2:	24 VAC, 60 Hz, screw terminal
MC3800-2X:	24 VAC, 50 Hz, screw terminal
MC3800-3:	230 VAC to power cable (plug not supplied)
Video Output:	BNC-type, unbalanced, 1.0 Vp-p, 75 ohms
Lens Connector:	4-pin connector.

Power Consumption:	
MC3800-2:	Approximately 4.5 W
MC3800-2X:	Approximately 4.5 W
MC3800-3:	Approximately 6.0 W
Operating Temperature:	14° to 122°F (-10° to 50°C)
Humidity:	20 to 80%
Storage Temperature:	-40° to 140°F (-40° to 60°C)
Acceptable Lens Weight:	Less than 2.2 lb (1 kg)
Construction:	Aluminum case
Finish:	Neutral beige
Tripod Receptacle:	1/4-inch UNC-20
Dimensions:	
MC3800-2/MC3800-2X	5.19 in. L x 2.25 in. H x 2.09 in. W (131.83 x 57.15 x 53.09 cm)
MC3800-3	7.03 in. L x 2.25 in. H x 2.09 in. W (178.56 x 57.15 x 53.09 cm)
Weight:	
MC3800-2:	10.6 oz (0.30 kg)
MC3800-2X:	10.6 oz (0.30 kg)
MC3800-3:	1 lb 9 oz (0.70 kg)

(Design and specifications are subject to change without notice.)

REGULATORY NOTICES

NOTE: This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

REVISION HISTORY

Manual #	Date	Comments
C1901M	11/96	Original version.
	4/99	Added MC3800-2X model. Revised manual to new format.